

28

Date: Tuesday, 6/19/2007 2:09:57 PM
 User: Kim Johnston

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services Drawing Name : SKID TUBE ASSEMBLY
 Job Number : 32970
 Estimate Number : 12520
 P.O. Number : N/A Part Number : D205634045
 This Issue : 6/19/2007 S.O. No. : N/A Drawing Number : D2580 REV C/DE09183B
 Prsht Rev. : NC Project Number : N/A
 First Issue : N/A Type : LANDING GEAR Drawing Revision : C/B
 Previous Run : 32969 Material : N/A
 Due Date : 7/11/2007 Qty: 1 Um: Each
 Written By :
 Checked & Approved By : J07.06.20
 Comment : Est Rev:0 Revised Steps 06-09-06 JLM

Additional Product

Job Number:



Seq. #:

Machine Or Operation:

Description :

1.0

DC

DOCUMENT CONTROL



Comment: DOCUMENT CONTROL

Photocopy D205-634 bluefile & type labels per PPP D205-634-045 CHG001

KJ 07-08-28 (1)

2.0

D25001190

Ext'n -1' Beam Tube 4"



Comment: Qty.: 1.0400 Each(s)/Unit Total : 1.0400 Each(s)

Pick:

Qty Part Number

Description

Batch

1 D2500-1-190

Skid Tube Extrusion

B29602

JD 7-6-27

3.0

D2596

205 Web



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty Part Number

Description

Batch

1 D2596

205 Web

B33058

4.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1- Inspect mat'l D2500-1-190 for damage

2-Cut D2500-1-190 per Dwg D2580 if necessary Debur ends

3-Drill pilot holes using drill jig DT 8149

4-Acid etch and Alodine tube per QSI 005 4.1

5-Open holes to 0.500" as per Dwg D2580 without cutting fluid

JD 7-6-26

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)							
DATE	STEP	Description of NC Section A	Corrective Action		Section B		Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date				

NOTE: Date & initial all entries

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Job Number: 32970

Part Number: D205634045

Job Number:



Seq. #:

Machine Or Operation:

Description :

6-Countersink holes as per Dwg D2580 without cutting fluid

JD 7-6-26

7-Deburr and blow out all chips from inside of tube

8-Bond web in place per QSI 015. Allow 12 Hrs. cure time before cutting

JD 7-6-27

Pick:

Qty Part Number Description Batch

A/R Sikaflex-291 M104732

Sikaflex expire date: 7-10-1

Start Time: 4:00 Date: 7-6-27

Fin Time: 10:48 Date: 7-6-28

5.0

BENDING

BENDING MACHINE



Comment: BENDING MACHINE

1-Bend as per program D2580.C on CNC Bender and Folio FT009

2-Cut tubes as per Dwg. D2580

EL 7-6-28

6.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Deburr ends after cutting. Remove alodine from around holes

EL 7-6-27

2-Drill extra fwd hole as per DEO 9183 using drill jig DT8461

R 7-7-3

3-Drill extra middle hole as per DEO 9183 using drill jig DT8462

4-Drill extra aft holes as per DEO 9183 using drill jig DT8463 & DT8091

7.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

EN 07/07/23 Q > ~~XXXXXXXXXXXXXXXXXXXX~~ PTO

8.0

D25763

Step (Machining Detail)



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:



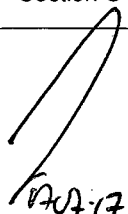


Qty Part Number Description Batch

1 D2576-3 Step

B33464 07 07.23

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes ☒ No ☐ DQA: ☒ Date: 07/08/10
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action		Sign & Date	Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng				
07/08/10	# 4.8	web was installed wrong holes in the web were mis-aligned with the tube.	 QS1042	see NCR 183 re-work holes in the web to allow x-bolt spacers to pass. open holes 0.020" horizontally. see Attached.	 7-7-10	 07-17	 QS1042	 07/08/10

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Drawing Name: SKID TUBE ASSEMBLY

Job Number: 32970

Part Number: D205634045

Job Number:



Seq. #:

Machine Or Operation:

Description:

9.0

D2579

Crossbolt Spacer



Comment: Qty.: 24.0000 Each(s)/Unit Total: 24.0000 Each(s)

Pick:

Qty

Part Number

Description

Batch

24

D2579

Spacers

B23081 BE 07-07-23

10.0

LARGE FAB 1

LARGE FABRICATION RESOURCE 1



Comment: LARGE FABRICATION RESOURCE 1

1-Prepare tube for welding D2576-3 StepRemove alodine as required.

DP 7-7-12

2-Weld step D2576 as per Dwg. D2580 and QSI 004

A/R

Aluminum Rod

M104907 BE 07-07-23

3-Weld crossbolt spacers D2579 as per Dwg. D2580 and QSI 004. For D2579

spacers, weld one

side, pass 3/8" drill, weld other side, pass 3/8" drill

A/R

Aluminum Rod

M104907 BE 07-07-23

4-Grind welds as per Dwg D2580 Grind flush ridge made from bending

DP 7-7-31

5-Drill holes for wearplates using DT 8217 Open holes to 19/64", adjust stopper not to hit web. Deburr

07/07/31 AHM

6-Counterbore crossbolt spacers to 7/16" ID x 1.0" deep as per Dwg D2580. Deburr holes

*****DO NOT COUNTERBORE EXTRA HOLES PUT IN AT STEP 13,14 AND 15 (LEAVE AT 0.384"Ø AS PER DEO 9183)****

7-Drill pilot holes for aft cap using DT 8215 Open holes to #6 Drill bit. Deburr

8-Drill pilot holes for Tow ring using DT8091, open to .640"and Deburr

DP 7-8-1

11.0

QC9

VISUAL WELDING INSPECTION



Comment: VISUAL WELDING INSPECTION

12.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

07/08/08 (1)

W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

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			Initial Chief Eng	Action Description Chief Eng		Sign & Date			

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Job Number: 32970

Part Number: D205634045

Job Number:



Seq. #:

Machine Or Operation:

Description :

13.0

POWDER COATING

POWDER COATING



m 102316



Comment: POWDER COATING

Powder Coat ****GREEN****Sandtex (Ref: 4.3.5.8) as per QSI 005 4.3

FL

07/08/22 (1)

14.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

CP 07/08/22 (x1)

15.0

D25771

Wearplate Fwd



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty

Part Number

Description

Batch

1

D2577-1

Wearplate

B32649

M

16.0

D25773

Wearplate Aft



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty

Part Number

Description

Batch

1

D2577-3

Wearplate

B32097

M

17.0

D25775

Wearplate, Centre



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty

Part Number

Description

Batch

1

D2577-5

Wearplate

B30812

esf

18.0

ALS71032130

Insert



Comment: Qty.: 44.0000 Each(s)/Unit Total : 44.0000 Each(s)

Pick:

Qty

Part Number

Description

Batch

44

ALS7-1032-130

Inserts

M102478

M 07-08-22 (1)

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

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Job Number: 32970

Part Number: D205634045

Job Number:



Seq. #:

Machine Or Operation:

Description :

19.0

AN960JD10L

Washer



Comment: Qty.: 44.0000 Each(s)/Unit Total : 44.0000 Each(s)

Pick:

Qty	Part Number	Description	Batch
44	AN960JD10L	Washer	M104885

MS

20.0

AN34A

Bolt



Comment: Qty.: 44.0000 Each(s)/Unit Total : 44.0000 Each(s)

Pick:

Qty	Part Number	Description	Batch
44	AN3-4A	Bolt	M104817

MS

21.0

D25941

Plug



Comment: Qty.: 16.0000 Each(s)/Unit Total : 16.0000 Each(s)

plug

Batch: B32651

MS

22.0

D25943

O-Ring



Comment: Qty.: 16.0000 Each(s)/Unit Total : 16.0000 Each(s)

o-ring

Batch: B27168

MS

23.0

D2855

Cap



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Cap

Batch: B34202

MS

24.0

AN35A

Bolt



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Bolt

Batch: M100188

MS

27-05-22 ①

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)							
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Job Number: 32970

Part Number: D205634045

Job Number:



Seq. #:

Machine Or Operation:

Description:

25.0

AN960JD10L

Washer



Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)

Washer

Batch: M 104885

07-08-22 0

26.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

1-Install inserts & wearplates as per Dwg. D2580. Use a drop of Sikaflex on insert holes before installing wearplates

A/R Sikaflex-291 M104616

Sikaflex expire date: 07-09

2-Coat D2594-3 O' rings with Petroleum Jelly and install on D2594-1 plugs as per Dwg D2580

3-Inspect for foreign object per QSI 024

4-Install 2855 Aft Cap as per Dwg D2580 and seal Fwd Step & Aft Cap with Sikaflex. Clean excess adhesive

A/R Sikaflex-291 M104616

Sikaflex expire date: 07-09

5-Wing Walk as per Dwg D2580 and QSI 005 4.4

M104942

Batch:

07/08/22 0

27.0

QC5

INSPECT WORK TO CURRENT STEP



07/08/23



All plugs in tube

Comment: Inspect Aft Cap, Fwd Step and Wing Walk of work to Current Step Inspect for Foreign objects per QSI 024

28.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and pack for shipping as per PPP D205-634 045

Location:

PPP Rev: E

07/08/29 0

29.0

QC21

FINAL INSPECTION/W/O RELEASE



07/08/30

Comment: FINAL INSPECTION/W/O RELEASE

Job Completion



B32970

07/08/30

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)							
DATE	STEP	Description of NC Section A	Corrective Action		Section B		Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng		Sign & Date			

NOTE: Date & initial all entries



DESIGN <i>[Signature]</i>	DRAWN BY <i>[Signature]</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DRAWING NO. D2580	REV. C SHEET 1 OF 2
DATE 98.08.26		TITLE 205 SKIDTUBE ASSEMBLY	SCALE NTS
A	96.09.16	NEW ISSUE	
B	96.12.02	AS MANUFACTURED	
C	98.08.26	REDRAWN, INCLUDED DEO 9094/9097	

RELEASED
98/09/17 DS

QTY	Part Number	Description
X	D2580-041	SKIDTUBE ASSEMBLY
*	D2500-1	EXTRUSION
1	D2596	205 WEB
1	D2575	AFT CAP
1	D2576 - 3	STEP
20	D2579	CROSS BOLT SPACER
16	D2594-1	PLUG
16	D2594-3	O-RING
1	D2577-1	WEARSHOE
1	D2577-3	WEARSHOE
1	D2577-5	WEARSHOE
44	ALS7-1032-130 or AKS7-1032-130 or AKS4-1032-130 or ALS4-1032-130	INSERT
46	AN3-4A	BOLT
46	AN960JD10L	WASHER

98.08.26
CP 98.08.28

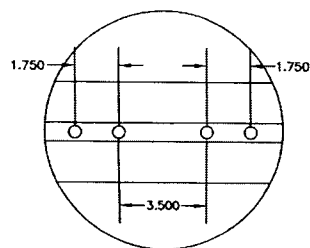
EFFECTIVE DEOS
98/12/14
DEO 9124
DED 9183

GENERAL NOTES:

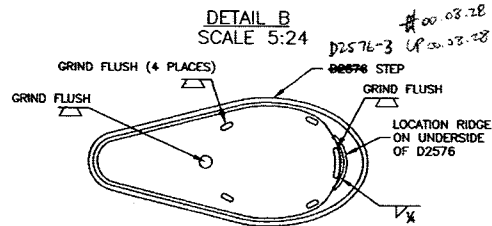
- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 2) LENGTH OF D2500-1 EXTRUSION BEFORE BENDING = 190 INCHES *
- 3) INSERT D2596 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241 ADHESIVE PER DART QSI 015 BEFORE BENDING. ENSURE HOLES LINE-UP.
- 4) BEND AS A SMOOTH RADIUS STARTING WITH A MAXIMUM CENTERLINE RADIUS OF 60 AND ENDING WITH A MINIMUM RADIUS OF 30. A MAXIMUM REDUCTION OF 0.200 IN DIAMETER IS ALLOWABLE IN THE BENT PORTION OF THE TUBE.
- 5) USE DART DRILL TEMPLATE TD2577-205 TO LOCATE AND DRILL $\varnothing 0.297$ HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTION D-D (44 PLACES) AFTER FINISH. INSTALL AN3-4A BOLTS AND AN960JD10L WASHERS WITH SIKAFLEX-241.
- 6) WELDING TO BE DONE PER DART QSI 004.
- 7) FINISH:
ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB
POWDER COAT ASSEMBLY GLOSS WHITE (REF 4.3.5.1) PER DART QSI 005 4.3
BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4
- 8) INSERT D2594-1 PLUG C/W D2594-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE) AFTER FINISH (16 PLACES).

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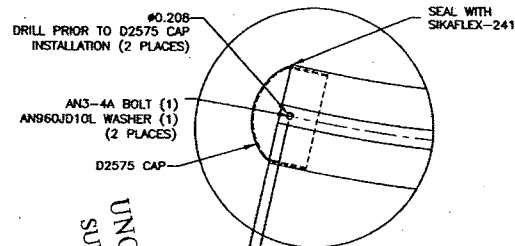
DETAIL A
SCALE 5:24



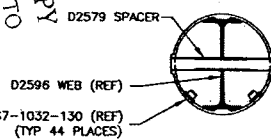
DETAIL B
SCALE 5:24



DETAIL C
SCALE 5:24

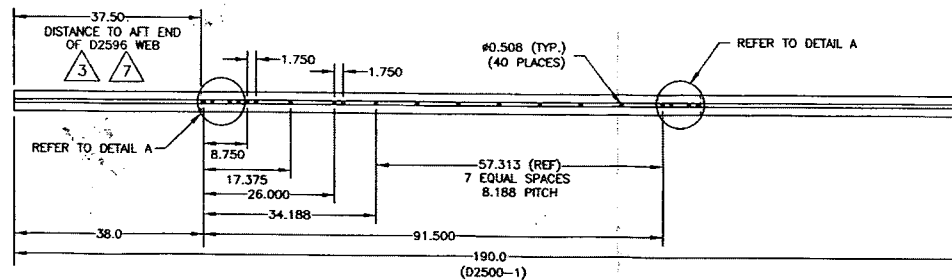


SECTION D-D
SCALE 5:24

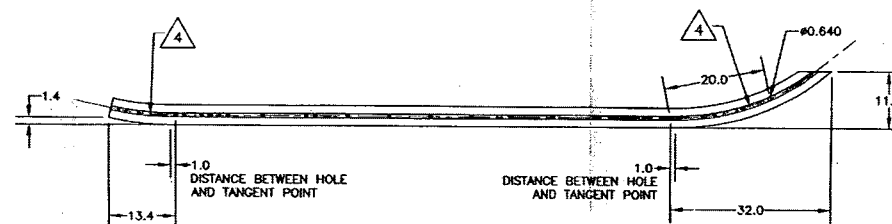


AFTER DRILLING AND BENDING ASSEMBLY
PERFORM THE FOLLOWING FOR #0.508 HOLES ONLY:
1. CHAMFER HOLE 0.050 X 45°
2. INSERT D2579 SPACER (20 PLACES)
3. WELD INTO PLACE AND GRIND FLUSH
4. C'BORE D2579 SPACER TO #0.437 X 1.00 DEEP

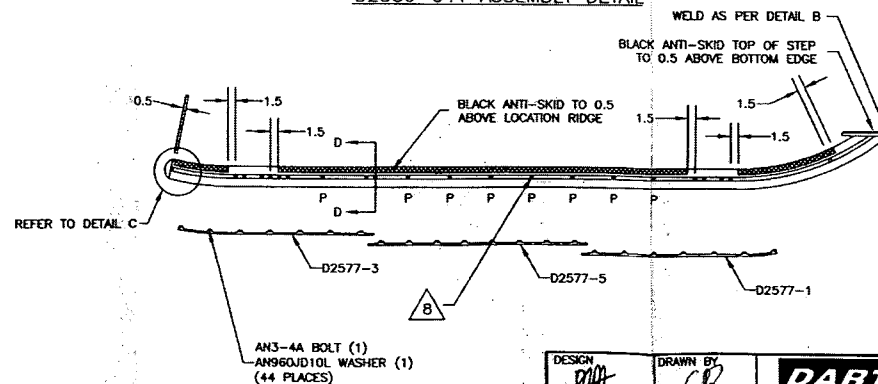
D2580-1 DRILLING DETAIL



D2580-1 BENDING AND CUTTING DETAIL



D2580-041 ASSEMBLY DETAIL



RELEASED
98/09/17 DS

DESIGN DHH	DRAWN BY CP	DART DART AEROSPACE LTD HARRISBURY, ONTARIO, CANADA	
CHECKED DHH	APPROVED CP	DRAWING NO. D2580	REV. C SHEET 2 OF 2
DATE 98.08.26		TITLE 205 SKIDTUBE ASSEMBLY	SCALE 1:24

DART

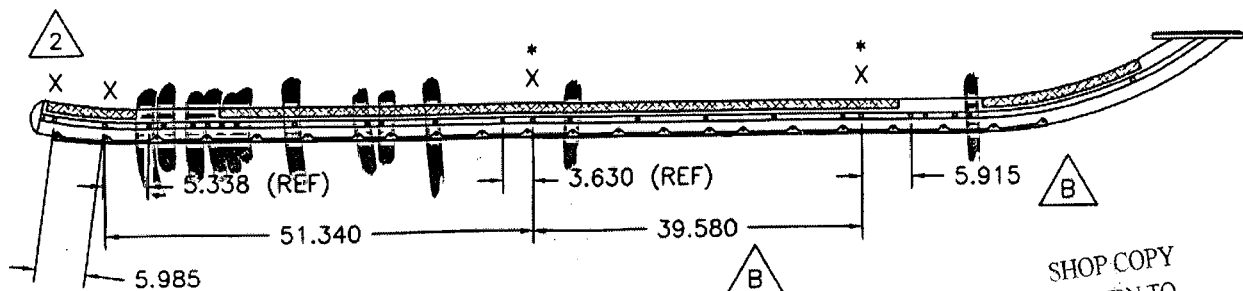
DESIGN RF	DRAWN BY RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED #	APPROVED #	DRAWING NO. DEO 9183	REV. B SHEET 1 OF 1
DATE 00.05.15		TITLE ADD SKIDTUBE P/N D2580-045	SCALE NTS
A	00.03.29	NEW ISSUE	
B	00.05.15	39.580 WAS 39.620	

DART ENGINEERING ORDER

AMEND DRAWING D2580 REV. C TO ADD D2580-045 ASSEMBLY

D2580-045 IS IDENTICAL TO D2580-041, EXCEPT FOR THE FOLLOWING CHANGES:

- 1) INSTALL CROSS BOLT SPACERS AT LOCATIONS MARKED 'X' ACCORDING TO THE FOLLOWING PROCEDURE.
 - a) DRILL $\varnothing 0.508$ HOLES AT LOCATIONS SHOWN BELOW MARKED 'X'. CHAMFER HOLES $0.030 \times 45^\circ$. NOTE THAT HOLES WILL ALSO HAVE TO BE TRANSFERRED TO THE D2596 WEB AT THE * LOCATIONS. IT IS ACCEPTABLE TO PRE-DRILL THE D2596 WEB IN THESE LOCATIONS BEFORE INSTALLING THE WEB IN THE SKIDTUBE. OPEN HOLES TO $\varnothing 0.63$ AND TOUCH UP WITH ALODINE PER QSI 005 4.1.
 - b) INSERT D2579 CROSS BOLT SPACERS INTO THE HOLES.
 - c) WELD INTO PLACE PER DART QSI 004 AND GRIND FLUSH.
 - d) REMOVE SPILL OVER LEAVING HOLE DIMENSION $\varnothing 0.380$ - $\varnothing 0.390$.
- 2) IT IS ACCEPTABLE TO GRIND A RELIEF IN THE D2855 AFT CAP TO PREVENT INTERFERENCE WITH THE SPACER AT THIS LOCATION.
- 3) POWDER COAT ENTIRE ASSEMBLY GREEN (REF. 4.3.5.8) PER DART QSI 005 4.3 INSTEAD OF WHITE (REF. 4.3.5.1).



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DART

DESIGN RF	DRAWN BY RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED [Signature]	APPROVED [Signature]	DRAWING NO. DSI 9184	REV. A SHEET 1 OF 1
DATE 00.03.29		TITLE ADD SKIDTUBE P/N D205-634-015	SCALE NTS
A	00.03.29	NEW ISSUE	

DART SERVICE INSTRUCTION

TO AMEND INSTALLATION INSTRUCTIONS D205-634 REV. B.

REF. CANADIAN STA: SH96-88
US FAA STC: SR00563NY

ADD D205-634-015 INSTALLATION. PARTS LIST IS IDENTICAL
TO PARTS LIST FOR D205-634-011 EXCEPT THAT:

D205-634-045 REPLACES D205-634-041
D2580-045 REPLACES D2580-041

THE DIFFERENCE BETWEEN D205-634-011 (D205-634-041)
AND D205-634-015 (D205-634-045) IS THAT EXTRA
SPACERS HAVE BEEN ADDED AT LOCATIONS MARKED 'X' AND
ASSEMBLY IS PAINTED GREEN.



D205-634-015 (D205-634-045)

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Jason Murdoch

From: David Shepherd [dshepherd@dartaero.com]
Sent: Tuesday, July 17, 2007 5:19 PM
To: 'L Lacelle'
Cc: 'Jason Murdoch'
Subject: RE: NCR for D205-634-045.

It is acceptable to ovalize the holes in the WEB HORIZONTALLY BY 0.020" so that the crossbolt spacers can pass through the skidtube.

David

From: L Lacelle [mailto:llacelle@dartaero.com]
Sent: Tuesday, July 17, 2007 8:24 AM
To: 'Jason Murdoch'; 'David Shepherd'
Subject: RE: NCR for D205-634-045
Importance: High

David,
These are ready to ship today, we would require an ok today.
Thx
Linda

From: Jason Murdoch [mailto:jmurdoch@dartaero.com]
Sent: July 6, 2007 7:42 AM
To: 'David Shepherd'
Cc: 'L Lacelle'
Subject: NCR for D205-634-045
Importance: High

Good day David. I have 4 skids that the webs were installed too far back resulting in an interference with the x-bolt spacers and the web. Especially, where the extra holes are. I would like to ovalize the hole vertically by 0.020". These webs were installed during the famous Dart black out last week, in the dark.

jmurdoch@dartaero.com
Q.C. COORDINATOR

No virus found in this incoming message.
Checked by AVG Free Edition.
Version: 7.5.476 / Virus Database: 269.10.8/904 - Release Date: 7/16/2007 5:42 PM

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7/18/2007

NO. 116

AWS D17.1.2001
QUALIFICATION TEST RECORD

Name Donny Elliott
Joint Welding Procedure TIG
Part number and Job number 20563404 / 4526671

TEST WELDS REQUIRED

BASE METAL Alum WELDING PROCESS TIG
Penetration Complete ☐ Partial ☒ Single Weld ☒ Double Weld ☐
Current AC ☒ DC ☐ Backing YES ☐ NO ☒

	Position	Vertical	Down <input type="checkbox"/>	Up <input type="checkbox"/>
Sheet Groove	1G <input type="checkbox"/>	2G <input type="checkbox"/>	3G <input type="checkbox"/>	4G <input type="checkbox"/>
Tube Groove	1G <input type="checkbox"/>	2G <input type="checkbox"/>	5G <input type="checkbox"/>	6G <input type="checkbox"/>
Sheet Fillet	1F <input type="checkbox"/>	2F <input type="checkbox"/>	3F <input type="checkbox"/>	4F <input type="checkbox"/>
Tube Fillet	1F <input type="checkbox"/>	2F <input type="checkbox"/>	4F <input type="checkbox"/>	5F <input type="checkbox"/>

Crossbolt Spacer Welded into Skidtube

TEST RESULTS

Visual Pass ☒ Fail ☐
Penetration Pass ☒ Fail ☐
Crossbolt Spacer Pass ☒ Fail ☐

The above named individual is qualified in accordance with AWS D17.1.2001 to weld

Date of Test Coupon 1/7/16 Qualifier Donny Elliott

